

On board ship the oil is carried in special tanks, or in the double bottom, and when viscous oil is used an arrangement of steam-heating coils is placed in these to liquify the oil sufficiently to allow of a service pump delivering it from them to settling tanks in the engine-room. In the settling tanks the water is drained off, and the oil pressure pump then draws the oil through suction strainers and delivers it to the oil heater, where it is heated by steam coils to a temperature of 150° to 270° F., according to the class of oil used. The oil is delivered to the burners at a pressure of 60 to 80 lb., and the burners are designed to atomize the oil sufficiently and give a flame directed at the proper angle. On the furnace fronts, to which the burners are attached, air directors are fitted, the burners passing through the centre of these. The directors are fitted with angled vanes which give the air a rotary movement, and the latter as it issues becomes intimately mixed with the fine oil spray from the burners, so that complete combustion takes place with production of a clear white flame free from smoke.

GASEOUS FUELS

With the exception of natural gas, which escapes from the earth in quantity only in a limited number of localities, the gases used as fuel are prepared in appliances primarily designed for that purpose, or are got as by-products. To the first category belong coal gas, water gas, producer gas and Mond gas; to the second coke-oven gas, which is in composition similar to coal gas, and blast-furnace gas, which is somewhat akin to producer gas in character but carries in it a larger amount of fine dust.

Coal Gas.—Coal when directly distilled to coke yields about 10,000 to 12,000 c. ft. of gas per ton, the composition of which varies within comparatively narrow limits according to the character of the coal used and the nature of the retorts, horizontal or vertical, in which it is treated. Greater departures from the normal result from admixture with more or less water gas, and it is not safe to-day to assume that lighting gas is identical with coal gas in the chemical sense.

Producer Gas.—When the fixed carbon of coal is burned

in a limited supply of air, carbon monoxide is produced mixed with the nitrogen of the atmosphere and a little derived from the coke. This mixture of carbon monoxide and nitrogen approximately in the proportions:

	Per cent.
Carbon monoxide ..	34*7
Nitrogen	65-3

is producer gas. If, however, the producer be fed with raw coal instead of with coke, as is generally the case, the resulting gas will carry with it the coal gas formed from the destructive distillation of the coal and also the gases formed from the destruction of the tar. Producer gas so formed is somewhat richer than that made from coke, and has a calorific value of about 135 to 140 B.Th.U. per cubic foot.